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## Factors Associated with Receipt of Cognitive-Behavioral Therapy or Prolonged Exposure Therapy Among Individuals with PTSD

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### Abstract

**Objective:** Little is known about factors associated with receipt of trauma-centered evidence-based cognitive behavioral therapy (TC-CBT). The aim of this study is to systematically review variables associated with initiation of TC-CBT among individuals with posttraumatic stress disorder (PTSD).

**Methods:** PubMed, PsychInfo, Web of Science, PILOTS, and Scopus were searched in a systematic manner up to 2018, and 26 relevant studies were recovered and analyzed.

**Results:** The average weighted initiation rate is 6% in larger hospital systems (with high rate of trauma) and 28% in outpatient mental health settings (range 4% to 83%). Age (OR=1.56, CI=0.51–1.61), female gender (OR=1.18, CI=1.08–1.27), Black or minority race (OR=1.16, 95% CI 1.03–1.28), Veteran Affairs PTSD service connection status (OR=2.30, CI=2.18–2.42), mental health referral (OR=2.28, 95% CI 1.05–3.50), staff exposure to TC-CBT (OR=2.30, CI=2.09-.52), staff workflow (OR=4.66, CI=1.60, 7.72), PTSD severity (OR=1.46, CI=1.13–1.78), and co-

morbid depression (OR=1.21, CI=1.14–1.29) increase the likelihood of TC-CBT initiation, while delayed treatment reduces likelihood of TC-CBT initiation (OR=0.93, CI=0.92–0.95). Qualitative studies show that mental health beliefs (i.e., stigma and readiness), provider organizational factors (i.e., low availability, privacy issues, etc.), and patient lack of time (logistic) are perceived as barriers to initiation by patients and providers.

**Conclusions:** TC-CBT initiation is increased when patients are older and female. Initiation is also higher when providers have more exposure to TC-CBT in their work environment and TC-CBT fit into their existing workflow.

### Keywords

PTSD; Cognitive Behavioral Therapy; Prolonged Exposure; Treatment Initiation; behavioral health services utilization; posttraumatic stress disorder

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Posttraumatic stress disorder (PTSD) is a hallmark consequence of traumatic event exposure. It is as disabling as many other serious mental disorders and leads to a higher likelihood of suicidality (1). Trauma-centered cognitive behavioral therapies (TC-CBT) have been identified as the most effective treatments for PTSD (2). TC-CBTs have been shown to reduce PTSD symptoms (3), sleep disturbances (4), and even improve quality of life (5). TC-CBTs include cognitive processing therapy (CPT) and prolonged exposure therapy (PE), along with a number of other treatments. As the name suggests, trauma-centered interventions help individuals learn how to process and sort out their specific traumas and trauma memories, rather than only coping with associated symptoms, triggers or coping.

The Veterans Health Administration (VHA), the largest PTSD treatment provider in the US, has invested heavily in expanding the use of two of the more well-known CBT interventions – CPT and PE (6). Implementation efforts include didactic training, consultation, a mentoring program, clinical progress note templates, and evidence-based treatment coordinators at VHA facilities (7). An abundance of data demonstrate that on average, veterans who complete evidence-based treatments in VHA facilities experience large reductions in symptoms (8).

Still, studies demonstrate relatively modest increases in overall treatment-seeking among those newly diagnosed, increasing from 21% in 2004 to 27% in 2010 (9). This coincides with a large number of studies of treatment initiation after traumatic exposure (10, 11). Meanwhile, these same studies also show a lag time of approximately seven years between trauma exposure and treatment-seeking among service members (12, 13), and 12 years among civilians (14). Thus, it appears that while those already engaged in mental health services can benefit from increased access to “gold standard” interventions, the availability of gold standard interventions may not significantly impact the overall demand or utilization among newly diagnosed, or those not already enrolled in mental health services.

It is also unknown what factors lead patients to seek TC-CBT interventions. Studies of behavioral health utilization commonly use some variation of a health service utilization prediction model (15). The Andersen Behavioral Model of Health Services Use (1995) is one of the most widely acknowledged models of health service utilization (16). This

multilevel model includes a combination of individual- and contextual-determinants of health service utilization. It is comprised of factors predisposing individuals to health care utilization (e.g., demographics, social structure, mental health beliefs), factors enabling healthcare utilization (e.g., logistical issues, provider organizational structure/resources), and need factors (e.g., perceived need or health status). Past reviews of treatment after traumatic events show an increased likelihood of initiation based on level of psychiatric need (higher PTSD severity), the type of traumatic event (military for men and interpersonal trauma for women), and socio-demographic characteristics (age, employment status, race, education and gender; 10, 11). Meanwhile, mental health beliefs (stigma, understanding of PTSD, etc.) play a major role in treatment-seeking among individuals with PTSD (17).

Existing reviews (18–20) provide reports on initiation of nonspecific PTSD psychotherapy. However, it is not known if the factors influencing treatment initiation for “mental health services” more generally are the same for TC-CBT treatments. Therefore, we systematically review the literature to determine the rate of TC-CBT treatment initiation and factors increasing the likelihood of initiation.

## Methods

### Procedure

A four-step search strategy, which includes identification, screening, eligibility, and inclusion, was used to identify peer-reviewed articles. We identified articles from five different databases (PubMed, Web of Science, Psycinfo, National Center for PTSD database (PILOTS), and Scopus; coverage up to September 2018) using the following keywords: “help seeking,” “utilization,” “post-traumatic stress disorder” or “PTSD,” “trauma,” “violence,” “victim,” “crime,” “combat,” “rape,” and “war.” Among the articles found through this search, we reduced eligible papers by filtering on “behavioral health” or “mental health.” Review studies were located through database searches and were also searched to identify articles that may have been missed through electronic databases. As Figure 1 shows (PRISMA diagram available in the online supplement), after removing duplicate studies, seven (CV, RM, SS, JB, RG, MO, JP) of the 13 authors analyzed titles and abstracts of all studies identified, and excluded papers that were irrelevant. Exclusion criteria consisted of clinical trials in which all patients had at least one TC-CBT encounter, studies that did not include individuals with PTSD (at least 60% of patients) or individuals who could make decisions about who is offered TC-CBT treatments, studies without adult participants, review studies or case reports, or where we were unable to find the study.

Next, three of the 13 authors (CV, RM, RG) analyzed the full-text versions of all remaining studies for the inclusion criteria of TC-CBT initiation. TC-CBT treatments included initiation of treatments in the 2018 Veteran Affairs/Department of Defense (VA/DOD) Clinical Practice Guideline for the Management of PTSD (2), like more generic CBT, CPT, PE, brief eclectic psychotherapy, narrative exposure therapy, eye movement desensitization and reprocessing therapy, and written narrative exposure. As shown in Figure 1 (flow diagram available online), out of 1,935 articles identified through search databases and review studies as potentially relevant, 357 were given full-text reviews, 26 of which fulfilled

inclusion criteria. We were able to quantitatively assess factors associated with increased TC-CBT treatment initiation in 16 of the 26 studies.

## Data Analysis

We used the Downs and Black Checklist (21) to evaluate the quality of studies. We selected the Downs and Black Checklist (1998) because it can be used to measure methodological quality of both randomized and non-randomized studies. After evaluating for quality, we calculated a weighted mean for treatment initiation (weighted for sample size), as well as other characteristics of the studies, including age, percent of the sample that was male, and percent that met criteria for PTSD diagnosis. Next, we followed the Andersen model and identified all predisposing, enabling, and need variables. Last, to determine the relationship between predisposing characteristics, enabling resources, need factors, and use of CPT/PE treatment initiation (See Table 4), we computed odds ratios and 95% confidence intervals for 16 of the 26 studies. For 10 of the studies, only descriptive or qualitative data were available, which precluded calculating odds ratios. The Stata user-written code, “METAN”, was used to calculate pooled odds ratios (weighted for sample size) and consistency ( $i^2$ ), if more than one study was identified (22).

## Results

### Quality

There are 27 items for use in the Downs and Black Checklist (1998) (21) quality assessment tool and four of the items are only relevant for randomized trials. Because no eligible study used randomization, the scale of quality ranged from zero to 23. Average weighted quality was 13.5 (SD=1.0, range 7–17) and the median quality was 13. A cutoff of 15 was established for high quality studies, and additional sub-analysis was performed on this sample. As shown in Online Supplementary Table 1, 10 of 26 studies had high risk of bias when it came to clearly describing participants, 15 of 26 studies had high risk of bias when it came to describing distribution of confounds, 11 of 26 studies had high risk of bias when it came to utilizing representative samples, and 14 of 26 studies had high risk of bias when it came to adjusting for confounding variables.

### Participants

Eighteen studies included VA patients with PTSD (23–41), one included National Guard veterans (42), one included United Kingdom (UK) Iraq war service members (43), and five included civilian patients (See Tables 1 and Online Supplementary Table 2; 44, 45–48). Almost half of the studies (n=12) utilized some version of a retrospective chart review. Usually, these studies relied primarily on medical record data, but four studies (31, 32, 35, 40) included reviews of VA chart progress notes for key terms related to TC-CBT treatment in VA PTSD clinics.

Seven studies used cross-sectional surveys. Mott and colleagues (2014)(33) recruited participants through TC-CBT-trained therapists at the VA to determine which characteristics led to initiation of either CPT or PE (See also (41, 49). Three of the other cross-sectional studies focused on patient choice between PE and SSRI (Selective Serotonin Reuptake

Inhibitors; 44, 45, 47), and dialectic behavioral therapy (DBT) and PE (46). Two studies used qualitative methods exclusively (27, 42) and one study provided rates of initiation preferences prior to randomization (24).

The 26 eligible studies involved a total of 716,851 participants, most of whom were diagnosed with PTSD (weighted mean=97.8%±5.9%, range=80–100%). Approximately 87% (86.9±1.7%, range 0% to 98.3%) of participants in the studies were male; almost all participants were in the military or were veterans (.12% were non-military in only five studies; 44–47, 48). Participants tended to be middle-aged (mean age=40.0±5.8, range 28–51.9; seven studies did not contain aggregated age data). Of the 17 studies that provided racial information on participants (n=290,017), about 63.3%±23.0% were Caucasian (range=17%–94%, 16 studies), 27.6%±14% were African American (range=13%–50%, 12 studies), 2.8%±1.8% were Asian (range=1.3%–4.8%, 3 studies), 11.6%±8.7% were Hispanic/Latino (range=2%–33%, 10 studies) and 1%±.9% were Native American (range=.6%–1.9%, 2 studies). Five of the studies reporting racial information only included dichotomous information on white (mean=79.8%±16%) vs. other racial groups (4 studies), or African American (14%) vs. other racial groups (1 study). All but two studies used US populations.

### Initiation of TC-CBT Treatments

Only more generic “CBT,” CPT and PE treatments were systematically tracked in the 26 studies. Twenty-three out of the 26 studies provided real-time rates of initiation of either CPT or PE (See Table 2). Overall, treatment initiation averaged at 40.0% ±28.5%), with a range between 4% and 83%. However, when we weighted for sample size, the amount of treatment initiation dropped significantly (weighted mean=6.2%±5.0%). Treatment initiation rates were slightly higher among outpatient mental health specialty clinic studies (i.e., these patients had been referred to specialty anxiety, PTSD or cognitive behavioral therapy clinic; weighted mean=27.9%±13.8%, range 6%–82%), compared to hospital or community studies (weighted mean=5.8%±3.6%, range=4%–83%). Hospital and community settings included primary care or emergency care. Patients were generally recruited through flyers, received a chart review diagnosis, or to our knowledge, either received a general mental health service referral or received no referral.

### Predisposing Characteristics Related to Initiation

Table 3 shows the themes or significant variables related to predisposing characteristics of the Andersen model that were identified in 21 of the 26 studies. As shown in Table 3, five (29, 33, 36–38) of 9 quantitative studies found age to be significantly related to initiation, and 2 (30, 33) of 3 quantitative studies showed military era status significantly affected initiation. Two (36, 38) of 8 quantitative studies found female gender to be associated with trauma-centered therapy.

As shown in Table 4, higher age (9 studies pooled OR=1.56, CI=1.51–1.61), Vietnam veteran era (3 studies pooled OR=1.58, CI=1.00–2.15), female (8 studies pooled OR=1.18, CI=1.08–1.27), black or minority race (9 studies pooled OR=1.16, CI=1.03–1.28), and interest in trauma-centered treatment (1 study OR=2.13, CI=1.37–3.30) increased the

likelihood of TC-CBT initiation among individuals. As noted previously, a number of studies have provided participants with the opportunity to choose between PE and other treatment alternatives, and then prompted them to justify their choices. When it came to utilization of PE, National Guard veterans in the Kehle-Forbes et al. (2014)(42) study were concerned about not being able to develop trusting relationships with their providers, especially when these providers had not seen combat. Stecker et al. (2013)(41) showed similar findings with more concern over stigma and readiness, than logistic issues. VA patients stated fear of being labeled a “crazy vet” (p. 282), and extensive fear of consequences, which included loss of future deployments, security clearances, adverse actions from commanding officers, etc. One veteran said that his VA doctor informed him that if he got treatment for PTSD, he would no longer be eligible for a kidney donation. The VA doctor explained to him that the VA did not want to pay for kidney transplants for individuals at risk for suicide. Several other studies also focused more heavily on knowledge and beliefs about TC-CBTs and providers. Kehle-Forbes et al. (2014)(42) found that the overwhelming theme was whether veterans actually believed TC-CBT treatments were credible treatments that could help them. There were additional concerns about emotional intensity of treatments and perceived side effects (See (31)). About 13% of veterans in Keller & Tuerk’s (2016)(29) study preferred SSRIs and about 6.5% felt they were not ready for TC-CBTs.

### Enabling Resources Related to Initiation

Enabling resources included logistic issues and organizational setting. Table 3 shows that in quantitative studies of treatment initiation, prior group psychotherapy (33), affordability (33), PTSD service connection (33, 38, 50), clinical exposure to TC-CBT in the work environment (34, 38, 40), referral source (mental health provider, not primary care provider; 29, 34), and provider access to TC-CBT champions (40) were associated with higher levels of TC-CBT initiation. Overall, access (i.e., VA service connection; 3 studies pooled OR=2.30, CI=2.18–2.42), mental health referral source (2 studies pooled OR=2.28, CI=1.05–3.50), staff exposure to TC-CBTs (3 studies pooled OR=2.30, CI=2.09–2.52), and TC-CBT adaptability to staff workflow (2 studies pooled OR=4.66, CI=1.60–7.72) increased the likelihood of TC-CBT initiation.

The major logistic theme was lack of time to devote to treatment (29, 31, 41, 42). Across studies, veterans reported that they often had a substantial amount of family, deployment, and financial constraints that consumed a large percentage of their time. They had trouble getting off work to get to scheduled appointments or driving to VA locations, which were sometimes some distance away. The monetary costs associated with taking time off work and driving long distances was also a reported concern (31, 42). Deployment and contract rotations among active duty service members and military contractors (31), and sometimes the need to relocate, reduced the flexibility needed to plan TC-CBT treatments effectively.

Among veterans, there were also substantially negative perceptions about the VA more generally (27). Concerns included staff turnover and providers’ ability to ensure privacy (31, 42). For instance, some patients said that VA providers informed them about the limitations

of privacy during the initial session, including limitations to confidentiality of active duty service members' treatment status (31).

### Need Factors Related to TC-CBT Initiation

Three of the 8 studies examining PTSD severity (25, 33, 48), four of the 9 studies examining co-morbid depression (36, 38, 48), two of the 5 studies examining substance misuse (26, 36), and all of the studies of delayed treatment (total 2) were significantly associated with TC-CBT treatment initiation. When studies were pooled, PTSD severity (6 studies pooled OR=1.46, CI=1.13–1.78) and co-morbid depression (9 studies pooled OR=1.21, CI=1.14–1.29) increased the likelihood of TC-CBT treatment initiation among individuals. Nevertheless, when treatment was delayed after an initial diagnosis of PTSD (i.e. patients waited to seek any type of mental health treatment after initial referral), patients were less likely to ever utilize TC-CBTs (2 studies pooled OR=0.93, CI=0.92–0.95).

Fewer qualitative studies examined need and perceived need. However, Lu et al. (2016)(31) conducted content analysis of process notes contained in electronic medical records and found that need played a prominent role (e.g., crisis events motivating treatment interest and remission reducing the likelihood of initiation). These process notes also show that severe need could change clinical priorities. For example, when a veteran with PTSD became suicidal or developed substance dependence, then treatment must shift from TC-CBT approaches to treatments intended to stabilize suicidality or addiction.

### Findings from Subgroups of High Quality Studies

Seven (25, 28–30, 36, 37, 48) out of the 16 quantitative studies examining factors associated with initiation had a quality score of 15 or more (total sample size of n=646,121, sample range n=115 to 630,746). Five of these studies used the outpatient psychiatric specialty clinics as a setting. Mean treatment initiation from high quality studies was higher (unweighted mean=51.1%±30.8%; weighted mean=9.3±4.6). Of the seven high quality studies, participants on average were older (weighted mean=45.7±4.5), and a similar number of females were participants (87.0%±2.0% male). Importantly, all participants had PTSD in the seven higher quality studies. High quality studies assessed the relation between age (4 studies), gender (5), race (4), marital status (1), education (1), military era (2), previous psychotherapy (1), referral status (1), service connection (1), staff exposure (1), staff training (1), PTSD severity (5), depression (4), and substance misuse (1). Age (OR=1.83, CI=1.76–1.89), black and minority race (OR=0.87, 95%CI 0.78–0.97), Vietnam era (OR=1.67, CI=1.12–2.22), service connection (OR=2.30, CI=2.18–2.42), staff exposure to TC-CBTs (OR=2.26, CI=2.18–2.34), staff training (OR=1.61, CI=1.43–1.79), depression (OR=0.85, CI=0.77–0.93), and substance misuse (OR=1.23, CI=1.12–1.35) were significantly associated with TC-CBT treatment initiation in the seven high quality studies.

### Heterogeneity

Heterogeneity was high among many of the predictors of initiation, and may be the result of variation between larger, high-powered studies and smaller, low-powered studies (See Online Supplementary Table 3). When just the seven high quality studies were included in the analysis, heterogeneity was reduced to  $i^2=0\%$  for gender, 0% for race, 0% for military



era, 15.2% for staff training, but still remained high for age, PTSD severity and depression. In addition, there tended to be an opposing direction of association between studies. For example, of the eight studies which examined the relation between PTSD severity and initiation, two showed that PTSD severity reduced initiation, while the remaining six studies showed that PTSD severity increased TC-CBT initiation. Some of the studies, like Mott (33) and Zayfert (48), showed a very large effect of PTSD severity, while other studies showed very small effects.

## Discussion

Of the over 249 studies of mental health treatment utilization of individuals with PTSD, only 26 examined treatment initiation of TC-CBTs. Reports of initiation ranged from 4% to 83% with weighted average of 28% referred by outpatient clinics and 6% by hospital settings. All but 5 of these studies focused on military or veteran populations, and almost all of the participants were men.

The mean rate of initiation (6% in hospital settings, 28% outpatient mental health settings) is similar to studies using the VA National Patient Care database (9), which showed that psychotherapy initiation (not limited to TC-CBT) was around 22% in 2007 and 27% in 2010. Rates of initiation were higher during war time among service members (ranging from 23% to 40%; 12, 13). The majority of the studies also examined the rate of initiation after referral to a specialty PTSD/anxiety clinic. Thus, initiation of PTSD treatment may mean a choice between TC-CBTs and other types of treatment offered through VA PTSD clinics (e.g., medication only, anger management, mindfulness training, or stress inoculation therapy).

Although some predisposing factors (i.e., age and military era) and need factors (PTSD severity, depression) did show a higher trend in initiation, overall, there was substantial heterogeneity of study designs, measures, etc. Qualitative studies of treatment initiation revealed the role of stigma and the ambivalence many veterans felt about whether or not to actually get therapy, and whether they could endure the side effects.

Patients were enabled by a combination of their own ability to time treatment according to already existing priorities, responsibilities, and providers' organizational constraints. For example, veteran patients often needed to manage the timing of their military service, deployment, and employment responsibilities with the constraints of VA providers, including the availability of consistent therapists, and ability to take time off work to attend counseling sessions. Concerns about privacy were a constraining factor, especially since studies mostly included military populations. Many VA patients feared that a mental health provider would alert their commanding officer, and thus damage their military career prospects. For active duty service members, utilization of the VA is also complicated because they are technically not eligible for VA health services until they separate from the military (51). Military health care (TRICARE) requires that active duty service members either use military treatment facilities for mental health care or for them to acquire a referral (51). These referrals are not always necessary because VA/military sharing agreements. Regardless, medical and mental health information is still shared between the military and

other mental health providers, including the VA and community-based agencies. The sharing of data between mental health providers and the military likely increases active duty members' concerns about privacy.

Studies showed that organizational factors such as provider TC-CBT training, provider workflow compatibility with TC-CBT, and consistent use of TC-CBT by providers, significantly enabled initiation. Variations in these practices may explain a significant amount of variation in initiation occurring between different studies in different organizational settings. Given the complexities of reporting evidence-based practice uptake in real-world settings and the range of different methods of determining initiation (i.e., general scan of medical records, probing process notes, recruiting trained workers, etc.), it is clear why the range between initiation rates varies so much from study to study.

Another complexity includes the role of providers themselves, who inform individuals with PTSD about evidence-based practices. According to the studies by Cook et al. (2014)(52) and Hamblen et al., (2015)(53), many providers hesitated to use interventions which activate fear memory with patients they are concerned will not be able to handle this type of therapy. This may explain why we found that delayed treatment was associated with lower rates of initiation and that comorbid substance misuse also lowered rates. The concerns among treatment providers about patient readiness should be examined more thoroughly, especially given the decades of data indicating that TC-CBTs are extremely safe. It is unclear, for example, whether providers are willing to change their minds about patients, and when they believe these same patients would be ready in the future. It is also unclear, except in a few of the qualitative studies, how providers in other specialties (primary care, internal medicine, nursing, cardiology, etc.) talk about mental health services with patients, what factors lead to their willingness to make referrals to mental health services, and whether electronic medical record notes influence the discretionary behavior of mental health providers.

The VA/DOD guidelines for PTSD, and VA in general, have encouraged shared decision making. A challenge is balancing what a predictive model might reveal about what a patient wants, given what is available for them. This is particularly challenging when effect sizes of these various predictors tend to be pretty small. In theory, it would appear that an avenue for improvement would be focused in the area of enabling factors. It seems that organizational factors are the more obvious choice for improvement since providers are better able to intervene in their organizational setting. Accordingly, the VA, as well as organizations that serve civilian populations, would see benefits from putting resources into TC-CBT leadership champions, provider training, and provider-protected clinical time to deliver TC-CBT in order to insure more consistent initiation in mental health clinics. It also could use these strategies to improve care-coordination with larger health systems and local military bases. Yet, organizational change assumes that the organization has access to unlimited capacity, and the organization has influence over their task environment (i.e., the system in which they deliver services). The VA has been under substantial pressure to reduce wait times for specialty consultations, and to respond to crisis events (especially suicide) in the past 5 years (54). This may impair successful organization change focused on increasing the number of patients initiating TC-CBT.

The current study has limitations worth noting. As stated previously, our findings drew heavily from military and veteran samples, and thus may not be generalizable to nonmilitary traumatized populations. In the review of mental health seeking among trauma-exposed individuals by van den Berk-Clark and Patterson Silver Wolf (2017)(11), it was noted that trauma-type was split by gender. Most of the intimate violence studies featured mostly women, while most of the military studies featured mostly men. Studies we reviewed also relied heavily on VA administrative data. This, to some extent, limits the analysis because the VA currently does not have precise identifiers for specific TC-CBTs offered, and does not show take-up by patient. Thus, studies tended to use different approaches for measuring TC-CBT initiation. The VA setting also has a much more developed system of TC-CBT dissemination than other types of health systems or community-based mental health providers. Organizational constraints and predictors may be different among these non-VA mental health providers.

There was significant heterogeneity for measures of time, setting, and methods of measurement of initiation even in studies in VA settings, which also makes it difficult to generalize across studies. All but two studies were done in the US, so these results may also not be generalizable to individuals outside the United States. Thus, we cannot definitively compute the percent of PTSD patients who initiate TC-CBT treatment, nor can we state conclusively that other factors may also increase the likelihood of initiation. Additional factors such as stigma, concerns about privacy, patients' perceived treatment readiness, timing of treatments, ability to manage the treatment regimen (9–12 sessions over 9–12 weeks), and availability and consistency of trained TF-CBT providers (i.e. low turnover – TF-CBT provider available for entire 12 week regimen) should also be examined using quantitative methods.

This study was novel because, unlike studies focused on generic mental health treatment initiation, we attempted to determine initiation of treatments and treatment regimens that have been found to be reliable in reducing PTSD symptoms. Providers who want to increase TC-CBT initiation should consider developing interventions that improve how both organizations and patients time and plan TC-CBT interventions. Future studies which combine national data with PTSD clinical sites across the nation are necessary to confirm initiation rates in VA facilities. In other words, it is necessary, first to understand the rate of individuals referred to PTSD clinics, and then to understand the rate of individuals within PTSD clinics who then initiate TC-CBTs. Furthermore, because only about 7% of the US population is in the military (55), it is necessary for there to be more initiation studies in civilian populations. Such will provide a more precise estimate of initiation and will clarify which factors increase the likelihood of initiation of interventions which are known to successfully treat PTSD.

## Supplementary Material

Refer to Web version on PubMed Central for supplementary material.

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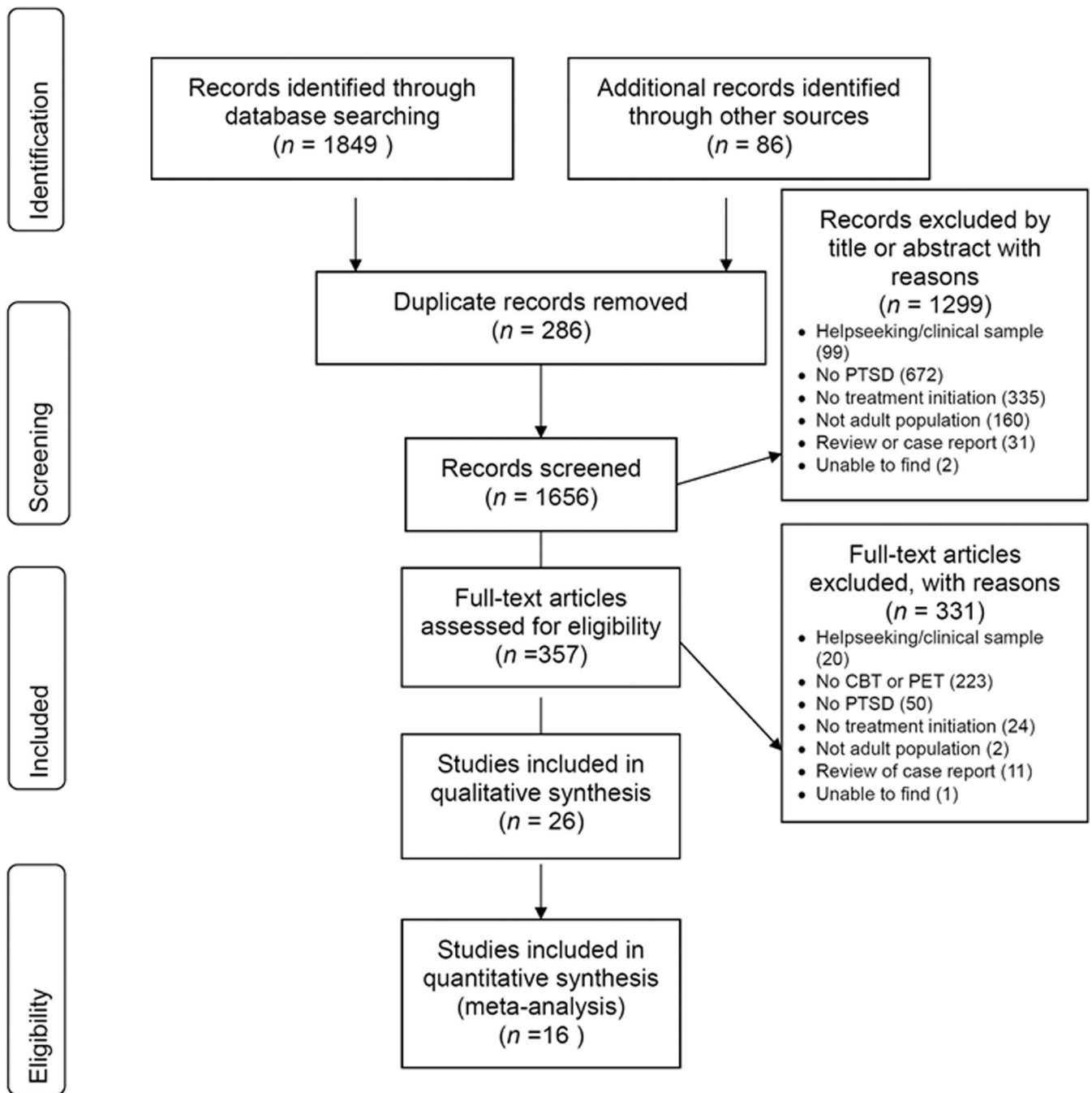
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**Highlights:**

- Trauma-centered cognitive behavioral therapies are some of the most effective treatments for post-traumatic stress disorder.
- Initiation of trauma-centered cognitive behavioral therapies is low in large hospital settings but higher in outpatient mental health facilities.
- Initiation of trauma-centered cognitive behavioral therapies is higher among organizations which invested in worker training and adapted these therapies into their current workflow.



**Figure 1.**  
PRISMA Diagram of Systematic Review



**Table 1:**

## Study Characteristics

| Study            | N      | Sample  | Dates     | Design                                       | Tx        | Outcomes                                |
|------------------|--------|---|-----------|--|-----------|---|
| Baker 2015(23)   | 156    | Veterans with PTSD                              | 2008–2012 | Retrospective chart review                   | PE/ CBT   | Initiation, completion PE/CBT           |
| Chen 2013(44)    | 200    | Treatment seeking civilian chronic PTSD         | 2012–2013 | Cross sectional survey                       | PE        | Preference PE vs. SSRI                  |
| DeViva 2016(24)  | 182    | Veterans with PTSD                              | 2012–2015 | RCT, Retrospective chart review              | CPT/PE    | Initiation, Education group             |
| Feeny 2009(45)   | 74     | Women recruited through adds for PTSD treatment | 2008–2009 | Cross sectional survey                       | PE        | Preference SSRI vs. PE                  |
| Grubbs 2015(25)  | 133    | Rural Veterans with PTSD                        | 2013–2015 | Retrospective chart review                   | CPT       | Initiation, engagement CPT              |
| Harned 2013(46)  | 46     | Women with PTSD and BP                          | 2012–2013 | Cross sectional survey                       | PE        | Preference DB or DB+PE                  |
| Hundt 2017(26)   | 201    | Veterans with PTSD                              | 2015–2016 | Retrospective chart review                   | PE/CPT    | Initiation                              |
| Hundt 2017b(27)  | 24     | Veterans with PTSD who decline PE/CPT           | 2015–2016 | Qualitative                                  | PE/CPT    | Initiation                              |
| Iversen 2010(43) | 821    | UK Iraq War Military                            | 2003      | Cross sectional survey                       | CBT, meds | Initiation engagement CBT, meds         |
| Kehle 2014(42)   | 58     | National guard veterans                         | 2013      | Qualitative                                  | PE, SSRIs | Preference of PE vs. SSRI               |
| Kehle 2016(28)   | 427    | Veterans with PTSD                              | 2010–2012 | Retrospective chart review                   | CPT/ PE   | Initiated PE/CPT, dropped out of PE/CPT |
| Keller 2016(29)  | 324    | Veterans with PTSD                              | 2015      | Cross sectional survey                       | PE/ CBT   | PE/CBT non-initiation                   |
| Lamp 2014(30)    | 476    | Veterans with PTSD                              | 2013      | Retrospective chart review                   | PE/ CPT   | PE/CPT interest and initiation          |
| Lu 2016(31)      | 63     | Veterans with PTSD                              | 2008      | Content Analysis                             | PE/ CBT   | Receipt of PE/CBT                       |
| Maguen 2018(32)  | 2960   | Veterans with PTSD                              | 2001–2015 | Retrospective chart review, Content Analysis | PE/CPT    | Receipt of PE/CPT, # sessions           |
| Mott 2014(33)    | 796    | Veterans with PTSD                              | 2008–2012 | Retrospective chart review, Content Analysis | PE/ CBT   | Initiation and completion of PE/CBT     |
| Rosen 2017(34)   | 61128  | Veteran patients of Clinicians trained in PE    | 2015–2016 | Longitudinal survey                          | PE        | Reach and maintenance of PE             |
| Shalev 2012(47)  | 397    | ER trauma patients in Jerusalem                 | 2003–2007 | Cross sectional survey                       | CBT/PE    | Initiation, Preference PE vs. SSRI      |
| Shiner 2013(35)  | 1924   | Veterans with PTSD                              | 2009–2010 | Retrospective chart review, Content Analysis | PE/ CBT   | Use of PE/CBT                           |
| Shiner 2018(36)  | 13473  | Veterans with PTSD                              | 2014–2016 | Retrospective Chart review                   | PE/CPT    | Use of EBP templates                    |
| Sripada 2018(37) | 270277 | Veterans with PTSD                              | 2015–2016 | Retrospective chart review                   | PE/CPT    | Use of EBP templates                    |
| Sripada 2018(38) | 273694 | Veterans with PTSD                              | 2015–2016 | Retrospective chart review                   | PE/CPT    | Use of EBP templates                    |
| Stecker 2013(41) | 143    | Veterans with PTSD                              | 2009–2012 | Cross sectional, qualitative                 | CBT       | CBT non-initiation                      |
| Tuerk 2013(39)   | 60     | Veterans with PTSD                              | 2007–2009 | Retrospective chart review                   | PE        | Completed minimum PE sessions           |

| Study            | N    | Sample                              | Dates     | Design                     | Tx      | Outcomes                         |
|------------------|------|-------------------------------------|-----------|----------------------------|---------|----------------------------------|
| Watts 2014(40)   | 1924 | Veterans with PTSD                  | 2009–2010 | Retrospective chart review | PE/ CBT | Veterans who receive PE/CBT      |
| Zayfert 2005(48) | 115  | Civilian patients of Anxiety Clinic | 2002–2004 | Cohort, longitudinal       | CBT     | Initiation and completion of CBT |

Note: CPT=cognitive processing therapy, PE=prolonged exposure, CBT=cognitive behavioral therapy, RCT=randomized control trial, DB= dialectical behavior therapy, SSRI=selective serotonin reuptake inhibitors

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**Table 2:**

## Characteristics of Sample and Utilization Rates

| Study                                  | Setting        | % Male | Average Age | % PTSD | % Utilization |
|--|----------------|--------|-------------|--------|---------------|
| Baker et al., 2015(23)                 | VA PTSD clinic | 90.4   | 46.7        | 100.0  | 58.0          |
| Chen et al., 2013(44)                  | PTSD Tx study  | 25.0   | 37.4        | 100.0  | 61.0          |
| Deviva et al., 2016(24)                | VA PTSD clinic | 93.0   | 48.5        | 100.0  | 34.0          |
| Feeny et al., 2009(45)                 | Convenience    | 0.0    | 31.8        | 100.0  | 82.0          |
| Grubbs et al., 2015(25)                | VA clinic      | 88.7   | 51.9        | 100.0  | 55.0          |
| Harned et al., 2013(46)                | BT Clinic      | 0.0    | 34.0        | 100.0  | 67.0          |
| Hundt et al., 2017(26)                 | VA PTSD clinic | 79.3   | 43.7        | 100.0  | 42.0          |
| Hundt et al., 2017b <sup>*</sup> (27)  | VA PTSD clinic | 79.0   | 44.6        | 100.0  | 0.0           |
| Iverson et al., 2017(43)               | VHA            | 90.0   | 34.0        | 79.7   | 7.3           |
| Kehle et al., 2014(42)                 | Military       | 98.3   | 35.4        | 100.0  | 53.0          |
| Kehle et al., 2016(28)                 | VA PTSD clinic | 84.1   | 46.4        | 100.0  | 82.0          |
| Keller & Tuerk, 2016 (29)              | VA PTSD clinic | 77.0   | 42.9        | 100.0  | 43.2          |
| Lamp et al., 2014(30)                  | VA PTSD clinic | 93.9   | 48.6        | 100.0  | 43.7          |
| Lu et al., 2016(31)                    | VA PTSD clinic | 89.0   | 35.3        | 100.0  | 13.0          |
| Maguen et al, 2018(32)                 | VHA            | 90.0   | 35.5        | 100.0  | 20.1          |
| Mott et al., 2014(33)                  | VA PTSD clinic | 90.0   | 46.6        | 87.9   | 11.0          |
| Rosen et al., 2017(34)                 | VHA clinicians | -      | -           | -      | 12.0          |
| Shalev et al., 2012(47)                | ER Jerusalem   | 54.0   | 38.0        | 100.0  | 72.0          |
| Shiner et al., 2013(35)                | VHA            | 93.0   | 53.0        | 100.0  | 6.0           |
| Shiner et al, 2018(36)                 | VHA            | 88.8   | -           | 100.0  | 28.0          |
| Sripada et al., 2018(37)               | VHA            | 87.0   | -           | 100.0  | 4.0           |
| Sripada et al., 2018(38)               | VHA            | 87.0   | -           | 100.0  | 4.0           |
| Stecker et al., 2013 <sup>*</sup> (41) | VHA            | 84.0   | 28.0        | 100.0  | 0.0           |
| Tuerk et al., 2013 <sup>*</sup> (39)   | VA PTSD clinic | 95.0   | 41.4        | 100.0  | 100.0         |
| Watts et al., 2014(40)                 | VA PTSD clinic | 93.0   | 53.0        | 100.0  | 6.0           |
| Zayfert et al., 2005(48)               | Anxiety clinic | 18.0   | 37.8        | 100.0  | 83.0          |

Note. VA=Veterans Affairs, BT=Behavioral Therapy, VHA=Veterans Health Administration, ER=emergency room,

<sup>\*</sup> Not counted in analysis.

**Table 3:****Predisposing, Enabling and Need Categories Effecting Utilization**

| <b>Categories</b>                            | <b>Qualitative Themes Identified (n=5 studies)</b>   | <b>Quantitative variables found to be significant (n=16 studies)</b>   |
|--|--|--|
| <i>Predisposing</i>                          |  |  |
| Demographics                                 | None   | Age (N=5), race (N=2), marital status (N=1), military era (N=2), gender (N=2)  |
| Mental Health Beliefs                        | Concerns about stigma (N=2), denial that treatment is necessary (N=2), readiness (N=2), trust/alliance with therapist (N=3), fear of repercussions related to military career (N=1) Preference for psychopharmacology approaches (N=1), interest in trauma-Centered therapies (N=2), credibility of treatment/perceived efficacy (N=1), Emotional intensity of treatment (N=2), perceived side-effects (N=2), timing of symptom relief (N=1), perception of VA (N=1) | Prior group psychotherapy (N=1), interest in trauma-Centered therapies (N=1)   |
| <i>Enabling</i>                              |  |  |
| Logistic Issues                              | Time (N=4), affordability (N=2), distance (N=2), poor therapeutic relationship (N=2), distance (N=2), redeployment/contracts (N=1)   | Affordability (N=1), PTSD service connection (N=3)   |
| Provider Organizational Structure/ resources | Training of providers (N=1), timing of discussion of treatment options with providers (N=2), consistency of providers (N=1), concerns about privacy (N=3) , negative experiences with the VA (N=1)   | Clinical exposure to PE/CBT (N=2), referral source (N=2), Access to PE/CBT champions (N=1), provider training (N=2), Clinician believes PE effective, # PTSD patients workflow (N=2), region (N=1), gender of clinician (N=1), race of clinician (N=1) |
| <i>Need</i>                                  |  |  |
| Need   | Clinical priorities (i.e., suicidality, substance dependence) (N=1) Crisis (N=1), remission (N=1)  | PTSD severity (N=3), depression co-morbidity (N=3), delay in treatment (N=2), length of stay (N=1)   |

Note: Number in parenthesis is the number of studies citing this result.

**Table 4:**

Pooled Effect Sizes of Studies Predicting Utilization (n=16 studies)

| Component                        | Total Sample | # Studies | Average OR | 95% CI     | Weighted OR | 95% CI     |
|----------------------------------|--------------|-----------|------------|------------|-------------|------------|
| Demographics                     |              |           |            |            |             |            |
| Age                              | 645,407      | 9         | 1.67       | 1.08–2.90  | 1.56        | 1.51–1.61  |
| Military Era (Vietnam)           | 964          | 3         | 1.48       | 0.75–3.21  | 1.58        | 1.00–2.15  |
| Gender (female)                  | 288,848      | 8         | 1.13       | 0.61–2.49  | 1.18        | 1.08–1.27  |
| Race/Ethnicity (Minority/AA)     | 288,470      | 9         | 1.38       | 0.47–12.65 | 1.16        | 1.03–1.28  |
| Marital Status (Married)         | 496          | 4         | 1.22       | 0.62–2.82  | 1.44        | 0.87–2.00  |
| Income                           | 116          | 2         | 1.78       | 0.37–9.08  | 1.52        | –1.19–4.89 |
| Education (HS)                   | 406          | 4         | 0.86       | 0.32–3.07  | 0.99        | 0.32–1.66  |
| Mental Health Beliefs            |              |           |            |            |             |            |
| Concerns about stigma            | 58           | 1         | 8.18       | 0.95–70.44 | 8.18        | 0.95–70.44 |
| Readiness/ambivalence            | 58           | 1         | 0.32       | 0.03–3.74  | 0.32        | 0.03–3.74  |
| Side effects                     | 58           | 1         | 0.14       | 0.02–1.37  | 0.14        | 0.02–1.37  |
| Preference for medication        | 58           | 1         | 0.06       | 0.01–0.23  | 0.06        | 0.01–0.23  |
| Previous psychotherapy           | 274,206      | 5         | 1.67       | 0.90–3.47  | 1.01        | 1.01–1.02  |
| Trauma-Centered interest         | 476          | 1         | 2.13       | 1.37–3.30  | 2.13        | 1.37–3.30  |
| Motivators                       |              |           |            |            |             |            |
| Disability claim                 | 133          | 1         | 2.01       | 0.38–10.65 | 2.01        | 0.38–10.65 |
| Logistic Issues                  |              |           |            |            |             |            |
| Time                             | 58           | 1         | 3.12       | 0.94–10.36 | 3.12        | 0.94–10.36 |
| Relocation                       | 58           | 1         | 1.38       | 0.12–16.26 | 1.38        | 0.12–16.26 |
| Affordability                    | 58           | 1         | 2.96       | 0.31–28.57 | 2.96        | 0.31–28.57 |
| VA Service Connection            | 631,067      | 3         | 1.89       | 1.31–3.22  | 2.30        | 2.18–2.42  |
| Organizational Structure         |              |           |            |            |             |            |
| Referral source (Mental Health)  | 61,452       | 2         | 2.09       | 1.22–3.86  | 2.28        | 1.05–3.50  |
| Staff training                   | 76,849       | 4         | 1.29       | 1.02–1.72  | 1.19        | 0.64–1.70  |
| Staff exposure                   | 693,796      | 3         | 2.70       | 2.15–3.83  | 2.30        | 2.09–2.52  |
| Workflow                         | 63,052       | 2         | 3.13       | 1.78–5.56  | 4.66        | 1.60–7.72  |
| Need                             |              |           |            |            |             |            |
| PTSD severity                    | 1,890        | 8         | 1.51       | 1.02–2.47  | 1.46        | 1.13–1.78  |
| Amount of Time treatment delayed | 274,490      | 2         | 1.67       | 1.13–2.63  | 0.93        | 0.92–0.95  |
| Co-morbid depression             | 288,486      | 9         | 1.62       | 0.91–3.53  | 1.21        | 1.14–1.29  |
| Co-morbid substance misuse       | 287,562      | 5         | 1.64       | 0.93–3.37  | 1.01        | 0.96–1.07  |

Note: Reference group is in parenthesis. AA=African American